

Harmful Algal Blooms

Concerns, Background and Potential Actions



Nutrient Work Group Meeting

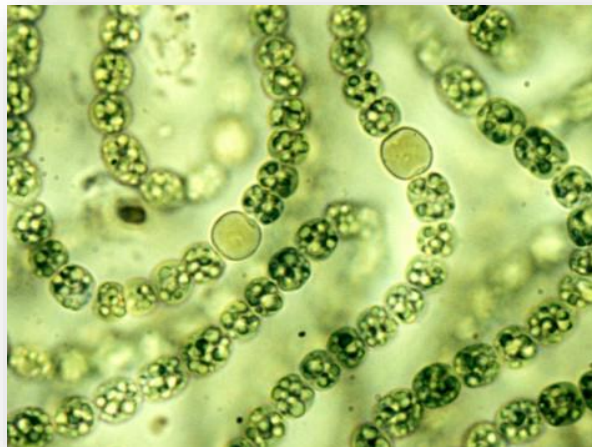
May 28, 2015

Presentation Outline

- Background on Harmful Algal Blooms (HABs)
- Potential Blooms in Wyoming
- Potential Actions
- Harmful Algal Blooms in Drinking Water Supplies
- Questions?



Ecan.govt.nz



Waterboards.ca.gov



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Communitypetclinic.net

Concerns About Algal Blooms

- DEQ Water Quality Laboratory has received periodic inquiries regarding algal blooms in reservoirs used for recreation
- Lab does not have a process to test for harmful algal blooms
- DEQ does not have a process for responding to citizen complaints about algal blooms
- Need for an Action Plan



Dec.ny.gov



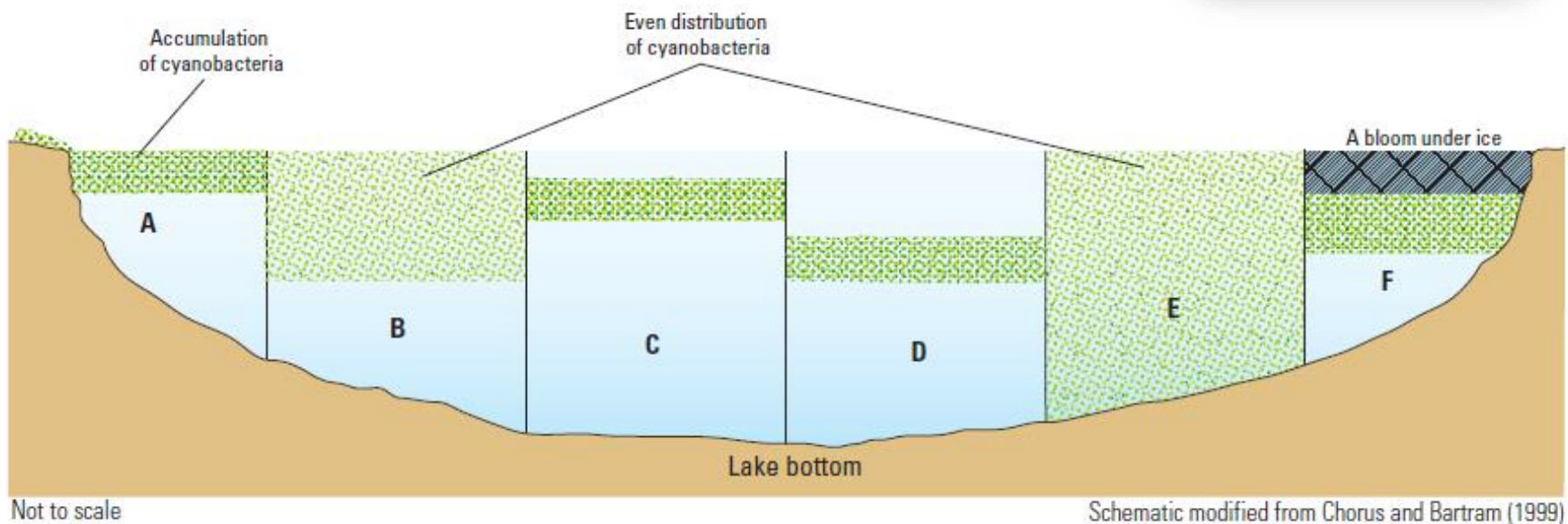
Landcareresearch.co.nz

Harmful Algal Blooms

- Dense overgrowths of “algae”
 - Actually cyanobacteria (blue-green algae)
 - Can be found throughout water column
 - Accumulations form scums or colonies
 - Not all algal blooms are harmful!



Whoi.edu



Cyanotoxins from HABs

- Health consequences for people and animals
 - Dermatoxins, hepatotoxins, neurotoxins
 - Pets and livestock: can die from consuming toxins
 - Humans:
 - nausea
 - fatigue
 - disorientation
 - rashes
 - distressed bowels
 - seizures
 - paralysis



Ncwtv.com



Blog,dhec.co.za

Bloom Forming Cyanobacteria WY

- Four genera that have produced blooms (>100,000 cells/liter) in Wyoming lakes/reservoirs:

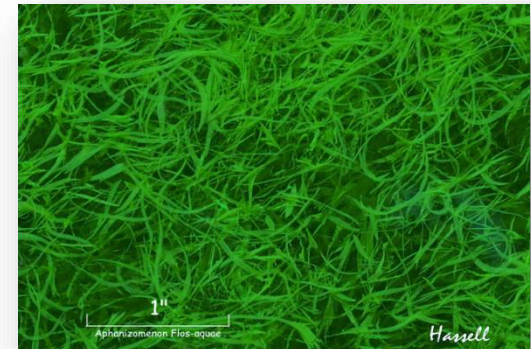
- *Anabaena*
- *Aphanizomenon*
- *Aphanocapsa*
- *Microcystis*

Anabaena



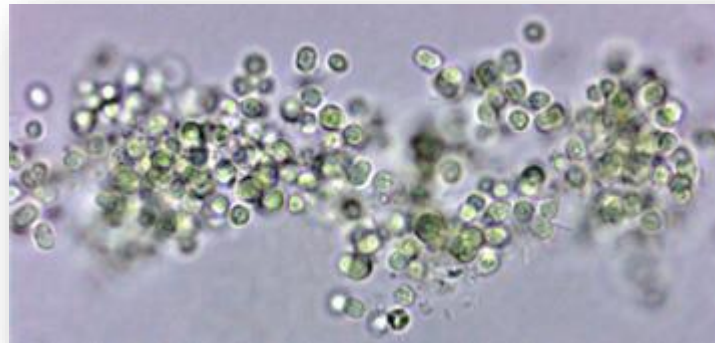
Micrographia.com

Aphanizomenon



Pixgood.com

Microcystis



Fmp.conncoll.edu

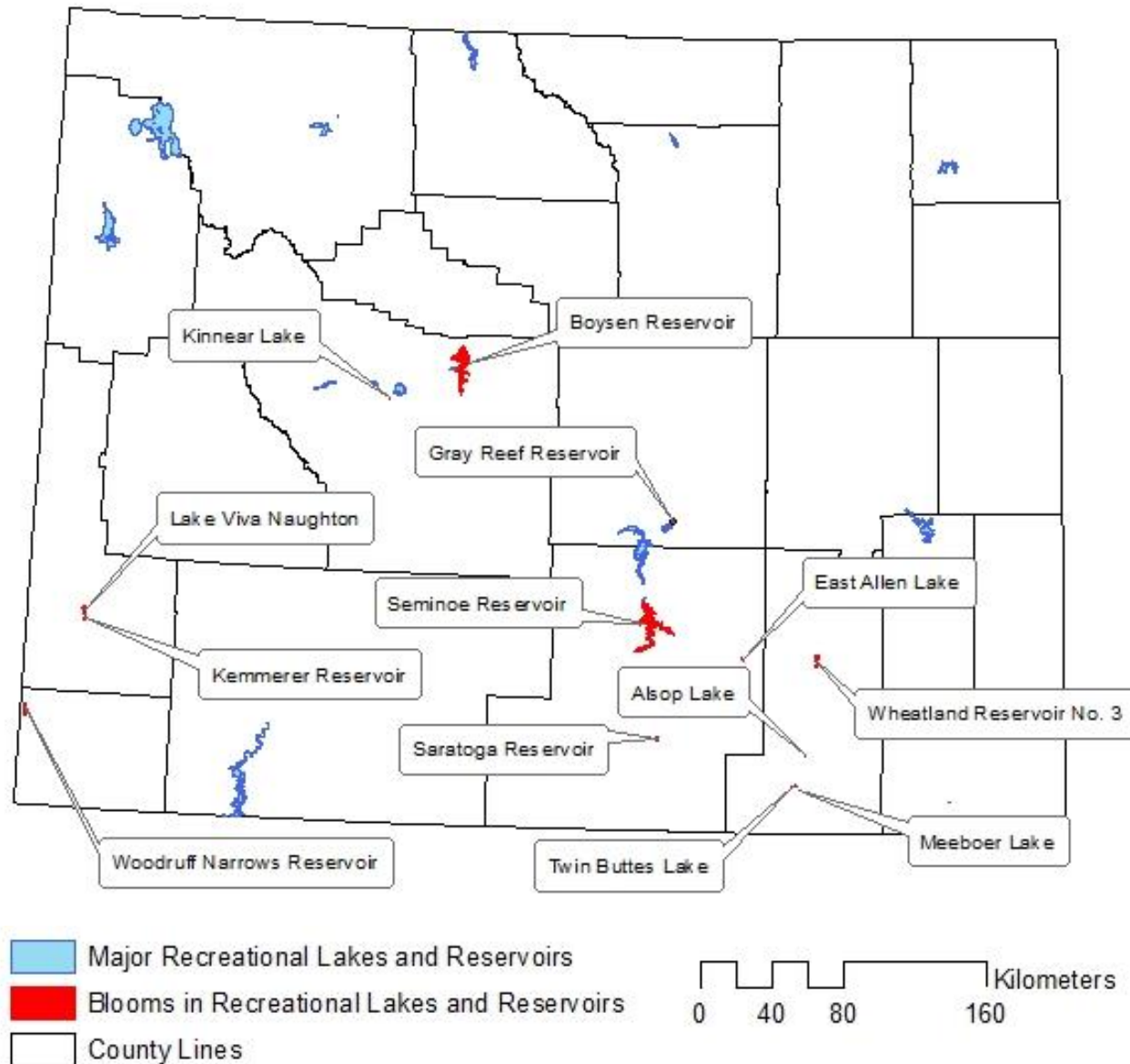
Aphanocapsa



Loch Tallant, Islay July 2000. J. Kinross

Algalweb.net

Bloom Forming Cyanobacteria WY

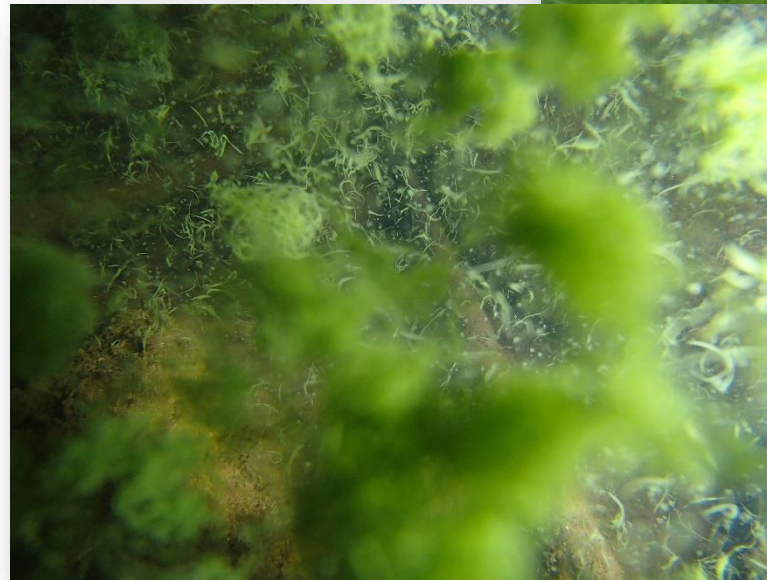


Potential Cyanotoxins in WY

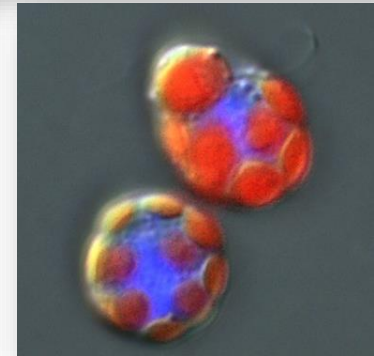
- These genera produce the following toxins:
 - Microcystin
 - Cylindrospermopsin
 - Saxitoxin
 - Anatoxin



Sjp.ac.lk

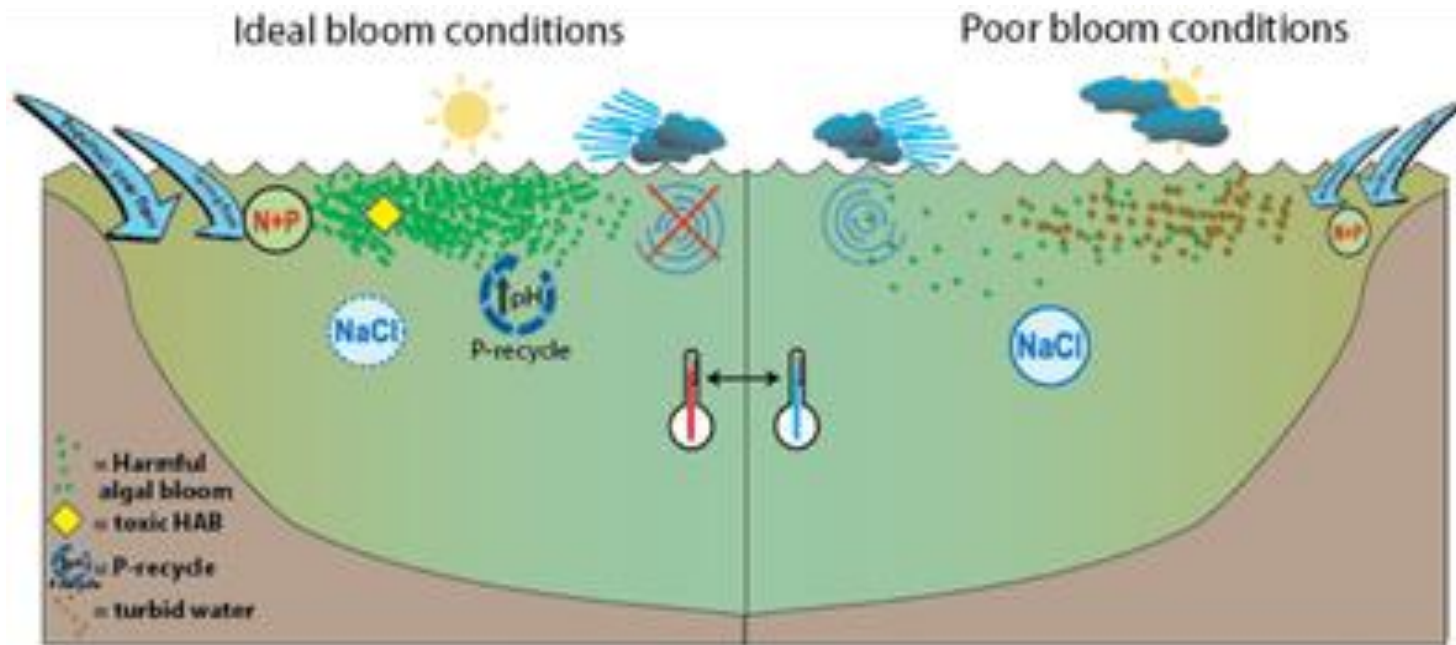


WDEQ



Uncw.edu

What Causes HABs to Form?



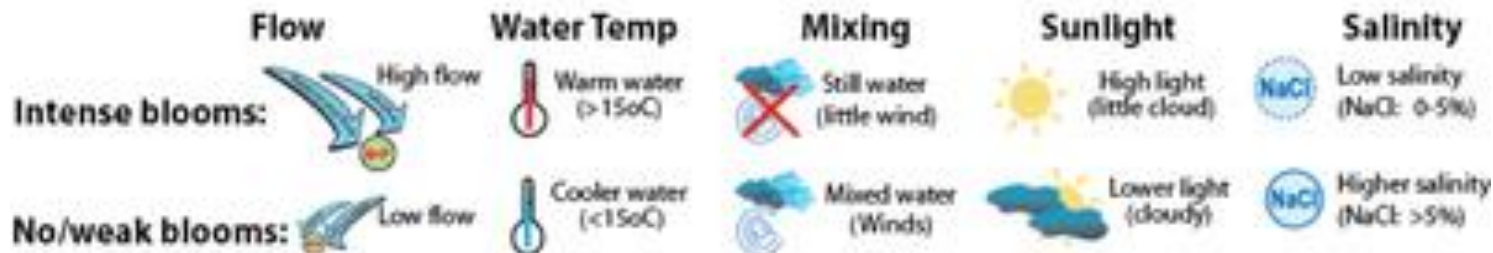
Excess nutrients

Low-water or low-flow

Sunlight and wind

Warmer temperatures

Low salinity



Conceptual diagram detailing the main factors that determine HAB occurrence and characteristics in the Potomac River
Diagram courtesy of the Integration and Application Network (ian.umces.edu), University of Maryland Center for Environmental Science. Source: Ecocheck

Action Plan for Recreational Waters



- Collaborative Effort?
 - Wyoming Department of Environmental Quality
 - Wyoming Department of Health
 - Game and Fish
 - Wyoming State Parks
 - Lake and Reservoir Management Agencies
 - Other State Agencies?

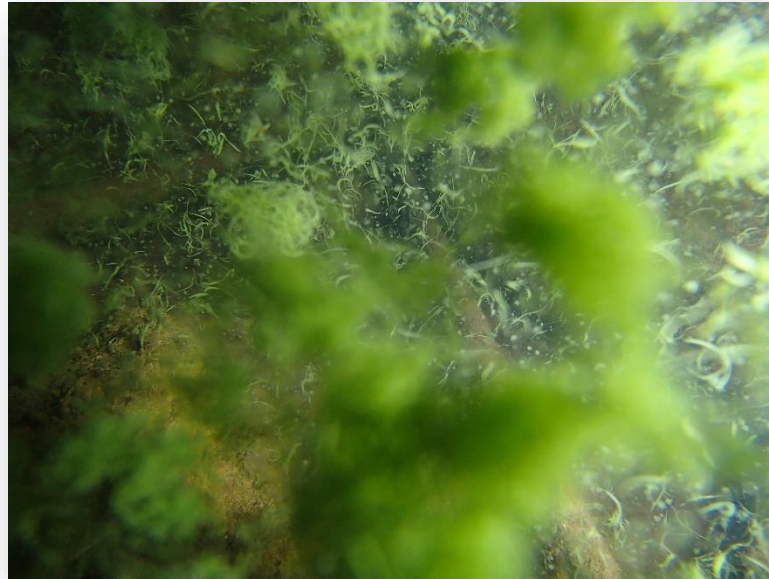


WDEQ

Action Plan for Recreational Waters



- Public outreach and information
- Process for responsive monitoring
- Procedures for issuing warnings, advisories, closures?



WDEQ



Action Plan for Recreational Waters



- Public outreach and information
 - What are HABs
 - What to look for?
 - What to do if you suspect a HAB (who to call, don't recreate)?
 - Where to display this information (parks, fishing regulations, other places)?

May 2015



Harmful Algal Blooms in Wyoming Waters

Wyoming Department of Environmental Quality Fact Sheet



WHAT ARE HARMFUL ALGAL BLOOMS?

Harmful Algal Blooms (HABs) are dense accumulations of algae. They are "harmful" because they can produce poisons (or toxins) that can cause irritation or illness in humans, pets and livestock.



WHAT DO YOU NEED TO LOOK FOR?

Depending on the species of algae, HABs can be various colors, shapes, and even occur at different depths in the water. Most common HABs are blue, green, yellow or brown. They appear as "spilled-paint" or "pea soup" throughout the water, or clump together to look like scums or grass clippings on the water surface.



WYOMING HABs

HABs can make the water appear blue-green in color and leave a scum layer on the water surface and shoreline.



WHAT TO DO IF YOU SUSPECT A HAB?

Avoid the water! Make sure children and pets stay out of the water. Toxins produced by HABs can cause skin irritation through contact and affect liver and/or central nervous system function if swallowed. Contact your local health agency or veterinarian if you or others experience any discomfort after using the water.

FOR MORE INFORMATION OR TO REPORT A HAB, PLEASE CALL:

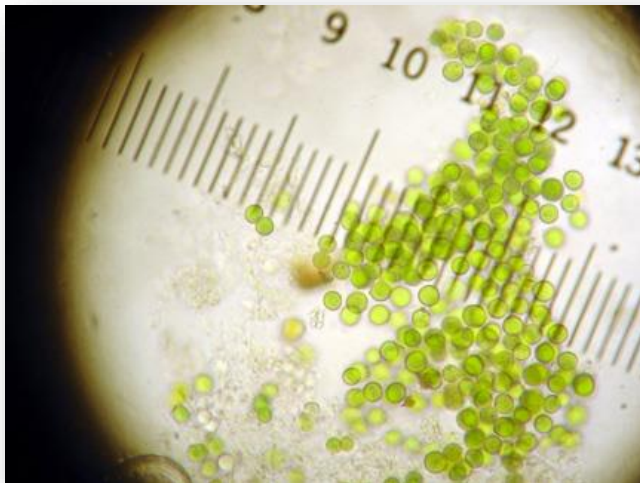
Wyoming Department of Environmental Quality (307) 777-7781
Wyoming Department of Health (307) 777-7656

Various factors make HABs form, but there is strong evidence that HABs form due to excess nutrients (such as fertilizers) that are commonly used on land.

Action Plan for Recreational Waters



- Process and procedure for responsive monitoring
 - Who collects samples?
 - What to collect (cyanobacteria, cyanotoxins, chlorophyll a)?
 - How quickly should sampling occur following call?
 - Who analyzes the data?



Marine.Rutgers.edu



Mtu.edu

- Mdpi.com

DANGER

LAKE CLOSED
due to toxic algae

**KEEP OUT
OF LAKE**

Call your doctor or veterinarian if you or your animals have sudden or unexplained sickness or signs of poisoning.

Report your algae blooms to Department of Ecology: **360-407-6000**

Call your local health department:

For more information: www.doh.wa.gov/algaltoxic / www.ecy.wa.gov/algaltoxic or [@toxicalgae](https://twitter.com/toxicalgae) / [toxics.hhs.gov](https://www.hhs.gov/toxics)

Toxicology
National Center for Human Genome Research
NIH

Next Steps

- Determine who will collaborate on the plan
- Determine when to meet
- Work out details of public outreach, monitoring, analysis, advisories, etc.
- Finalize the HAB Action Plan for Recreational Waters



HABs in Drinking Water Supplies



- HABs and/or cyanotoxins can impact public waters supplies
 - Toxins are not removed during conventional drinking water treatment
 - Currently, there are no maximum contaminant levels under the Safe Drinking Water Act for cyanotoxins
 - EPA did release draft action levels for cyanotoxins on May 6, 2015

Microcystin

0.3 ppb for Children

1.6 ppb for Others

Cylindrospermopsin

0.7 ppb for Children

3 ppb for Others



HABs in Drinking Water Supplies



- EPA has primacy over the Safe Drinking Water Act/public waters supplies in Wyoming
- Is monitoring for HABs and/or cyanotoxins occurring in public water supply reservoirs?
- Should monitoring for HABs and/or cyanotoxins be occurring?
- What types of monitoring should occur?
- Is each drinking water supply responsible for monitoring or does DEQ need to be involved in those efforts?
- Do we need an action plan in place for monitoring for HABs and/or cyanotoxins in public drinking water supplies?

HABs Workshop



- EPA is hosting a Harmful Algal Bloom Workshop
- September 30th and October 1st
- Rapid City, SD
- Workshop will address recreational impacts and drinking water impacts
- Would be great for partner agencies to attend (Health, Drinking Water, Other Interested Groups)

Questions?



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307-777-7079

